

What is claimed is:

1. An optical recording medium-manufacturing apparatus, comprising:

5        an abutment section including a cut-forming blade section that has a hollow cylindrical shape and is pushed into a resin layer formed on one side of a disk-shaped substrate, thereby forming a circular cut in the resin layer;

10       a punching blade section including a cutting edge that is pushed into the disk-shaped substrate, for punching a central hole smaller in diameter than the circular cut, through the disk-shaped substrate;

      a moving mechanism that moves said abutment  
15 section in directions toward and away from said cutting edge of said punching blade section;

      a control section that controls motion of said abutment section caused by said moving mechanism; and

      an ultrasonic generator that causes ultrasonic  
20 vibration of said abutment section,

      wherein said control section causes said moving mechanism to move said abutment section while causing said ultrasonic generator to cause ultrasonic vibration of said abutment section, in an approaching direction  
25 toward said cutting edge of said punching blade section, to thereby cause said cut-forming blade section to be pushed into the resin layer to form the circular cut, and while maintaining a state of the ultrasonic vibration of said abutment section and a pushed-in  
30 state of said cut-forming blade section, cause said punching blade section to be pushed into the disk-shaped substrate from the other side of the disk-shaped substrate to form the central hole.

2. An optical recording medium-manufacturing apparatus as claimed in claim 1, wherein said abutment section has an indentation circular in plan view formed in a surface thereof which is brought into contact with the resin layer when said cut-forming blade section is in the pushed-in state, at a location inward of a location where said cut-forming blade section is arranged.

3. An optical recording medium-manufacturing apparatus as claimed in claim 1, including a positioning protrusion disposed in a central portion of said punching blade section in a state slidable in the directions toward and away from said cutting edge of said punching blade section, and a first urging device urging said positioning protrusion toward said abutment section, and

wherein said positioning protrusion has a foremost end thereof protruded toward said abutment section with respect to said cutting edge of said punching blade section, and is capable of being fitted in a positioning hole formed in a central portion of the disk-shaped substrate, and

wherein said moving mechanism causes said abutment section to move in the approaching direction, thereby causing said positioning protrusion fitted in the positioning hole to move together with the disk-shaped substrate in the approaching direction, to cause said punching blade section to be pushed into the disk-shaped substrate.

4. An optical recording medium-manufacturing apparatus as claimed in claim 1, including a substrate-receiving table having an insertion hole formed in a central portion thereof, for inserting said punching

blade section, and a second urging device that urges said substrate-receiving table toward said abutment section such that normally, a surface of said substrate-receiving table for being brought into  
5 contact with the disk-shaped substrate is positioned toward said abutment section with respect to said cutting edge of said punching blade section, and

wherein said moving mechanism causes said abutment section to move in the approaching direction  
10 to cause said substrate-receiving table to move in the approaching direction together with the disk-shaped substrate, thereby causing said punching blade section to be pushed into the disk-shaped substrate, and

wherein said substrate-receiving table allows the  
15 disk-shaped substrate to move in the approaching direction when the disk-shaped substrate is pressed by said moving mechanism.

5. An optical recording medium-manufacturing apparatus as claimed in claim 1, including a substrate-  
20 holding device that attracts a part of the disk-shaped substrate outward of a location where the central hole is to be formed to hold the disk-shaped substrate thereat, and a punched piece-holding device that holds a punched piece which has been punched off by said  
25 punching blade section.

6. An optical recording medium-manufacturing apparatus as claimed in claim 1, wherein said ultrasonic generator causes longitudinal vibration of said abutment section.